What is claimed is:

1. A spatial light modulator comprising:

a multi-pixel display array; and

a multi-pixel memory array having pixel storage cells;

wherein at least some pixels of the multi-pixel memory array are disposed outside the display array.

2. The spatial light modulator of claim 1 wherein all of the pixels of the memory array are disposed outside the display array.

3. The spatial light modulator of claim 1 further comprising:

at least one local pulse width modulation drive circuit coupled to at least one of the pixel storage cells.

a global counter coupled to the local pulse width modulation drive circuit.

4. The spatial light modulator of claim 3 wherein:

the display pixels of the multi-pixel display array comprise first display pixels of a first color, and second display pixels of a second color;

the global counter includes,

a first global counter coupled to the local pulse width modulation drive circuits of the first display pixels, and

a second global counter coupled to the local pulse width modulation drive circuits of the second display pixels.

5. The apparatus of claim 4 wherein:

the display pixels of the multi-pixel display array further comprise third pixels of a third color.

6. The apparatus of claim 5 wherein:

the global counter further includes,

a third global counter coupled to the local pulse width modulation drive circuits of the third display pixels.

7. The apparatus of claim 3 wherein:

the multi-pixel display array includes display pixels of at least two different colors; and

the global counter is adapted to count up to two respective different values and is switcheably coupled to the respective different color display pixels to provide global counter values to their local pulse width modulation drive circuits in a time-slice manner.

8. The apparatus of claim 7 wherein:

the multi-pixel display array includes display pixels of three different colors.

9. The apparatus of claim 8 wherein

the three colors are Red, Green, and Blue.

10. A spatial light modulator comprising:

control logic;

a pixel memory array coupled to the control logic and occupying a first area of the spatial light modulator; and

a pixel display array coupled to the control logic and the pixel memory array, and occupying a second area of the spatial light modulator, wherein the first and second areas are substantially non-overlapping.

11. The spatial light modulator of claim 10 wherein:

the pixel display array comprises a plurality of pixel display cells, each having disposed within its area an associated pulse width modulation driver circuit; and

the pixel memory array comprises a plurality of pixel memory cells.

12. The spatial light modulator of claim 11 wherein:

the control logic comprises a counter for providing a count value;

the pulse width modulation driver circuit comprises a comparator coupled to compare the count value to a pixel value stored in an associated pixel array cell of the pixel memory array.

13. The spatial light modulator of claim 12 further comprising:

means for providing non-linearity in the pulse width modulation.

14. The spatial light modulator of claim 11 wherein the pixel memory array comprises:

more memory cells than the pixel display array has pixel display cells; and

means for providing redundancy in the pixel memory array.

~~20.~~ 15 A method of manufacturing a light modulator, the method comprising:

constructing, in a first area of the light modulator, a pixel display array including multiple display pixels; and .

constructing, in a second area of the light modulator that is substantially non-overlapping with the first area, a pixel memory array including multiple pixel storage cells.

~~21.~~ 16 The method of claim 20 further comprising:

constructing, within each of a plurality of the display pixels, a pulse width modulation driver circuit.

~~22.~~ 17 The method of claim 21 further comprising:

constructing a counter having an output coupled to each of the plurality of display pixels;

constructing, within each of the pulse width modulation driver circuits, a comparator having a first input coupled to the output of the counter and a second input coupled to receive a pixel data value from the pixel memory array.

~~23.~~ 18 The method of claim 22 wherein constructing the comparator comprises:

configuring the comparator to determine whether the pixel data value is greater-than-or-equal-to the counter output.

~~24.~~ 19 The method of claim 23 further comprising:

constructing a lookup table to provide non-linear response in the pulse width modulation.

~~25.~~ 20 The method of claim 24 performed in an order as recited.

~~30.~~ 21 A method of operating a light modulator, the method comprising, for each respective pixel cell in a plurality of pixel cells in a pixel display array:

performing a digital function on a pixel data value and a present counter value to generate one of a first result or a second result; and

in response to the first result, activating the pixel cell;

in response to the second result, deactivating the pixel cell.

~~31.~~ 22 The method of claim 30 wherein:

the digital function comprises a comparison.

~~32.~~ 23 The method of claim 30 further comprising, over time:

incrementing the counter value from 0 to N-1, wherein N is a number of bits of color depth represented in the pixel data value; and then

wrapping back to 0.

~~33.~~ 24 The method of claim 30 further comprising:

detecting that a pixel memory cell in a pixel memory array is not operating correctly; and, responsively

logically replacing that pixel memory cell with a redundant memory cell.

~~34.~~ 25 The method of claim 30 further comprising:

performing non-linear pulse width modulation.

~~35.~~ 26 The method of claim 30 wherein:

the digital function is performed outside the pixel cell.

36. 37 The method of claim 30 wherein:

the digital function comprises using the present counter value to index into a lookup table.

40. 38 A display device comprising:

a display including a first plurality of pixel display cells;

each of the first plurality of pixel display cells including,

(1) an electrode,

(2) a phase modulation driver circuit coupled to drive the electrode, and including,

(A) a comparator coupled to receive a counter value and a pixel value from outside the pixel display cell, and

(B) no multi-bit pixel value storage.

41. 39 The display device of claim 40 wherein the display further includes:

a second plurality of pixel display cells, each of which includes,

(1) an electrode,

(2) a phase modulation driver circuit coupled to drive the electrode, and including,

(A) a multi-bit pixel value storage, and

(B) a comparator coupled to receive a counter value, and coupled to receive a value stored by the multi-bit pixel value storage.

42. 40 The display device of claim 41 wherein the second plurality of pixel display cells each further includes:

(C) a second multi-bit pixel value storage coupled to provide the pixel value to a comparator in the phase modulation driver circuit of one of the first plurality of pixel display cells.

43.31 The display device of claim 40 wherein the display device is a silicon light modulator.

44.32 The display device of claim 40 wherein the display device is a liquid crystal display.

45.33 The display device of claim 40 wherein the display device is a plasma display panel.

50.34 A projection device comprising:

a polarization beam splitter; and

a first light modulator coupled in optical contact with the polarization beam splitter, the first light modulator including,

a first pixel display array in a first region of the first light modulator, and

a first pixel memory array in a second region substantially not overlapping the first region of the first light modulator, such that at least a plurality of pixel memory cells of the first pixel memory array lie outside the first region of the first light modulator.

51.36 The projection device of claim 50 further comprising:

a second light modulator coupled in optical contact with the polarization beam splitter, the second light modulator including,

a second pixel display array in a first region of the second light modulator, and

a second pixel memory array in a second region substantially not overlapping the first region of the second light modulator, such that at least a plurality of pixel memory cells of the second pixel memory array lie outside the first region of the second light modulator.

60.36 A spatial light modulator comprising:

a display array having display pixels; and

a memory array having pixel value storage cells each associated with a corresponding one of the display pixels, wherein at least some of the storage cells are located outside the display array.

61.37 The spatial light modulator of claim 60 wherein:

all of the storage cells are located outside the display array.

62.38 The spatial light modulator of claim 60 further comprising:

at least one comparator coupled to compare a counter value against a pixel value from one of the pixel storage cells.

63.39 The spatial light modulator of claim 62 wherein:

the at least one comparator comprises a plurality of comparators, each uniquely associated with a respective one of the pixel value storage cells.

64.40 The spatial light modulator of claim 62 wherein:

the at least one comparator comprises a plurality of comparators, each uniquely associated with a respective group of the pixel value storage cells.

65.41 The spatial light modulator of claim 63 wherein:

each respective group of the pixel value storage cells comprises one of a row and a column of the pixel value storage cells; and

each of the plurality of comparators is configured for time slice multiplexing comparisons of the counter value against respective values stored in the individual ones of its associated row or column of pixel value storage cells.

66.42 The spatial light modulator of claim 62 wherein:

the at least one comparator comprises exactly one comparator, which is configured for time slice multiplexing comparisons of the counter value against each of the pixel value storage cells.

67.43 The spatial light modulator of claim 62 wherein:

the at least one comparator is disposed outside the display array.

~~70.~~ 94 An article of manufacture comprising:

a machine-accessible medium including data that, when accessed by a machine system, cause the machine system to construct the apparatus of claim 10 as a monolithic integrated circuit device.

~~71.~~ 95 The article of manufacture of claim 70 wherein the machine-accessible medium further includes data that, when accessed by the machine system, cause the machine system to construct the apparatus of claim 13 as a monolithic integrated circuit device.

~~80.~~ 96 An article of manufacture comprising:

a machine-accessible medium including data that, when accessed by a machine system, cause the machine system to perform the method of claim 30.

~~81.~~ 97 The article of manufacture of claim 80 wherein the machine-accessible medium further includes data that, when accessed by the machine system, cause the machine system to perform the method of claim 31.